NBER Economics of Digitization Tutorial Application

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1 Contact Information

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2 Description of Graduate Study

I am a 4th year PhD candidate in the Department of Economics at Stanford University. I will be graduating at the end of this academic year in June 2020, and I will be working at a tech company afterward. I have completed all of the field requirements for Public economics, Behavioral/Experimental, and Causal Inference Econometrics. My secondary interests are Labor and Urban economics. Last year, I attended the Public and Labor seminars regularly. This year, I have been attending Public and causal inference seminars regularly.

2.1 Description of Internship Experiences

2.1.1 Quora

I worked as a data science intern at Quora in summer 2018. I gained institutional knowledge about how Quora balanced their multi-sided market: question askers, writers, readers, and advertisers. I built a model to analyze differences in new user behavior by gender and user type and discovered that women tended to have different preferences for content in their feed. I worked on improving the statistical methodology of Quora's experimentation platform by introducing winsorization to increase power.

2.1.2 Facebook

I was a data scientist/research scientist intern at Facebook in summer 2019. The product I worked on was an advertiser-facing experimentation platform that enabled advertisers to run A/B tests on Facebook to identify the causal effect of their ads. I contributed to improving the methodology for the platform's randomization algorithm and recommended a strategy to increase power. I gained a lot of institutional knowledge about targeted advertising and the practical challenges of running randomized controlled experiments at scale. I also gained insight into issues facing tech companies such as privacy, due to the $5 billion fine from the FCC that Facebook received while I was there. There is some chance that I will return to this team after I graduate, but I have not made a final decision yet.

3 Research Interests

- Dissertation title: Essays in Housing and Experimentation
- Description: One paper on foreclosures, one paper on gentrification, and one paper on experimentation platforms in tech companies.
- Committee members: Rebecca Diamond, Nick Bloom, Guido Imbens

3.1 Research Projects

3.1.1 Effect of High-Skilled Firm Entry on Local Migration (with Franklin Qian)

- Main Advisor: Rebecca Diamond
- Abstract: What happens to low-skilled workers when a large influx of high-skilled workers move into an area? We study whether there is inclusive growth when high-skilled workers migrate to a city in response to the entry of a large establishment, which we call high-skilled firm entry. We construct an instrument, driving time, to proxy for the neighborhood treatment intensity from the firm entry. For a set of about 400 entries, we examine changes in neighborhood characteristics in areas receiving high-skilled firm entries. Neighborhoods that are closer to the firm entry experience growth in home value and income. We also study how individuals re-sort in response to firm entry. The share of incumbents who move is higher for the most treated neighborhoods. We will conduct further analysis to decompose the treatment effects by renter/owner status and skill group. We build an unique data set with over 1 billion observations that tracks individual address histories, which are linked to neighborhood and property characteristics, ownership status, and individual financial outcomes.

3.1.2 The Effect of Foreclosures on Homeowners, Tenants, and Landlords (with Rebecca Diamond and Adam Guren)

- Abstract: How costly is foreclosure? Calculations of the social cost of foreclosure typically focus on financial costs. Using random judge assignment in Cook County, Illinois, we find evidence of significant non-pecuniary costs of foreclosure, particularly for foreclosed-upon homeowners. Foreclosure causes housing instability, reduced homeownership, moves to smaller homes in worse neighborhoods in terms of income and school quality, and personal trauma such as divorce. We find significantly muted negative effects for renters who are evicted due to landlord foreclosure or for landlords, suggesting the combination of eviction and the financial loss of foreclosure is particularly potent. Our estimates imply that foreclosure is far more costly than current estimates imply and that the costs are disproportionately borne by owners who lose their home.

3.1.3 Balancing Covariates in Online Experimentation (In progress)

- Main Advisor: Guido Imbens
- Abstract: Tech companies conduct many online randomized controlled experiments, or A/B testing, which are typically far more complex than the RCTs described in the economics literature. I aim to bridge the gap between theory and practice in the area of balancing covariates between treatment and control groups by providing a set of practical guidelines for experimenters. While the problem of balancing covariates is simple, the solution is complex due to challenges such as sequential assignment, relatively few observational units compared to number of covariates (such as clustered or network experiments), or in cases where randomization is assigned at a different level than the unit of analysis (such as page-level views and user behavior). This project is early stage, and I am open to collaborating with a tech company, formally or informally, on a specific application of this general problem.

4 Why I Would Like to Attend

I am interested in attending the tutorial so that I can learn more about research that will complement my existing knowledge of the tech industry from a practical standpoint. Even though I was an intern, people in tech have asked me for my opinion regarding various topics at the intersection of tech and economics, and I would like to be able to point them to the relevant literature. I aspire to build a career in tech, and I feel responsibility to make decisions that are grounded in empirical research. Since Stanford's seminars related to Digitization topics are fairly decentralized, I look forward to the possibility of learning about this research all in one place.